FACTSHEET: METHANE

INTRODUCTION

This factsheet provides basic information for private water well owners regarding methane in their well water. To determine if water is generally safe to drink, water test results are compared to the US Environmental Protection Agency (EPA) **Primary Drinking Water Regulations** table of contaminants and the EPA **Secondary Drinking Water Standards**. The above standards only apply to public water systems, but the quality and health implications are the same for private well owners. In addition, the Wyoming Department of Environmental Quality (WDEQ) has a set of standards (Water Quality Rules and Regulations (WQRR) Chapter 8 Table 1) for water quality based on class of use, including domestic, agriculture and livestock. Keep your analytical results and your sampling documentation with your well information for future reference if there is a question about change in water quality.

WHAT IS METHANE?

Methane (CH_4) is a colorless, tasteless, and odorless gas and is the main constituent of natural gas. Methane is naturally occurring and found in coal seams, oil and gas formations, environments containing decaying organic matter (i.e. swamps), and microbial activity, or from anthropogenic sources (i.e. landfills, wastewater treatment). Methane can accumulate in voids within rocks and soils as free-gas and dissolve into groundwater, like the carbonation in soda.

Methane migrates from areas of high pressure to areas of low pressure. Well drilling can disrupt the equilibrium pressure in the subsurface and cause methane to migrate to areas of lower pressure such as shallower aquifers and water wells. Methane migration can also be influenced by the rising and lowering of water tables within aquifers.

When water containing methane is pumped to the surface, the pressure drops and the temperature changes, causing methane to be released. Methane is released faster from hot water, which is one reason why methane, or other gas issues, are often worse when running hot water.

IS METHANE IN MY WATER HAZARDOUS?

Methane is not considered a health threat in drinking water, since dissolved methane readily escapes from water. However, if enough methane concentrates in poorly ventilated or enclosed spaces (i.e. pump house/pit) it may represent an explosion or asphyxiation hazard.

Methane is highly flammable, with a lower explosive limit (LEL) of 5.3 %. The LEL is the lowest percentage of gas in an atmosphere that can be ignited; once the concentration is at or above the LEL, the gas can be ignited by any ignition source (i.e. water heater pilot light, light switches). Before methane is used as a fuel, an odorant is added to the gas to help detect leaks, but remember, naturally occurring methane is odorless.

WHAT ARE SIGNS OF METHANE IN MY WATER?

Methane can sometimes be recognized as effervescent gas bubbles in water drawn from a faucet, or sounds similar to boiling water coming from plumbing. In addition, gurgles or bubbling noises can frequently be heard from wells.

HOW DO I TEST FOR METHANE IN MY WATER?

A list of certified labs can be found on the WDEQ Know Your Well Webpage (deq.wyoming.gov/wqd/know-your-well).
Contact your selected laboratory for testing

procedures and sample bottles. Please note that sampling for methane requires proper methodology to get accurate results. It is suggested that methane sampling be conducted by properly trained professionals.

If your water contains concentrations of methane above 28 mg/L the United States Department of the Interior, Office of Surface Mining, suggests that immediate action be taken to reduce the methane concentration. Methane concentrations below 10 mg/L are generally considered safe. Wells with levels between 10 and 28 mg/L should be regularly monitored, and well owners may wish to consider treatment to lower the methane level.

If the methane in your water well is potentially related to sources such as sewage or solid wastes, it is suggested that your water also be tested for coliform bacteria and nitrates+nitrites.

WHAT CAN BE DONE TO TREAT MY WATER FOR METHANE?

The information below is intended as an information source only. The WDEQ suggests you discuss appropriate water treatment options with a qualified water treatment specialist or licensed water well contractor.

Methane is not removed from water by common water treatment methods such as sediment filters or water softeners. Generally, methane can be reduced to safe levels by properly venting the water well. Vented water well caps should be installed by licensed water well drillers with experience installing methane well vents. Venting can reduce the concentration of methane entering a house or other confined structure. In addition to venting the well, if the wellhead is located in an enclosure, the structure should also be vented.

For high levels of methane in groundwater, venting of the well may not be sufficient to reduce methane concentrations to safe concentrations for use in the home. In these cases, an aeration system should be installed. A company experienced in the design and installation of such systems should be used to install these systems. Aeration releases gas from suspension in the water so it can be vented to the atmosphere.

REFERENCES

Kentucky Department for Environmental Protection, Division of Water, August 2003, *Methane Gas and Your Water Well.*

Minnesota Department of Health, January 2018, *Methane in Well Water Well Management Program (www.health.state.mn.us/divs/eh/wells/waterquality/methane)*

State of Indiana, Department of Environmental Management, Department of Health, and Department of Natural Resources, *Methane Gas & Your Water Well, a Fact Sheet for Indiana Water Well Owners.*

Water Systems Council, Wellcare®, March 2011, *Information for you about Methane Gas and Groundwater*

Wellowner.org, *Methane,* accessed March 6, 2018 (wellowner.org/water-quality/methane)